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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/803,382	03/18/2004	Reiyao Zhu	HT4005USNA	5472

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EXAMINER

EINSMANN, MARGARET V

ART UNIT	PAPER NUMBER
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1751

DATE MAILED: 12/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/803,382	Applicant(s) ZHU, REIYAO	
	Examiner Margaret Einsmann	Art Unit 1751	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>4/19/04</u> . | 6) <input type="checkbox"/> Other: ____. |

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Campbell et al., US 6,946,412 or its equivalent publication 20040077241, in view of Lunsford et al., US 6,132,476.

Campbell et al. disclose a fiber blend of modacrylic fiber and aramid fiber also including a nylon, meeting the limitations of instant claims 5 and 6, and having an antistatic component, meeting the limitation of claim 7. Campbell et al. further teach that the blended fibers are dyed with cationic dyes as claimed in the temperature range of 70-100 degrees C. as claimed.

The following quotations are from 20040077241, paragraphs [0014], [0029], [0032], [0033] and [0034] which teach the specifics of the blended fiber, the dyeing process, and the garments so dyed:

[0014] In one exemplary embodiment, fabric constructed according to the present invention is formed from two types of yarns. One yarn type, also referred herein as "body yarn", since it forms substantially the main body of the fabric, is formed substantially from modacrylic fibers, or a blend of modacrylic fibers and aramid fibers

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that are spun in accordance with conventionally known techniques. It has been found that fabrics formed from such blended yarns, wherein the modacrylic fibers used to form the yarns provide a flame-resistance rating that meets at least the vertical flame burn test minimum criteria for safety apparel. The blended aramid fibers provide additional strength and energy absorption. The second yarn type, also referred herein as the "anti-static yarn", is a blend of modacrylic fibers and conductive anti-static fibers. It has been found that metallic fibers such as stainless steel fibers blended with modacrylic fibers provide suitable electrostatic discharge and low voltage potentials. In one preferred embodiment, the second yarn comprises about 20 percent stainless steel fibers and about 80 percent modacrylic fibers. The fabric may be either woven or knit. The inherently flame resistant material is dyed in conventional fashion in a jet dye machine with cationic, or basic, dyestuff compositions to obtain International Yellow or International Orange hues that will meet the luminescence and chromacity requirements of ANSI/ISEA-107-1999.

[0029] The illustrated fabric is woven; however, other constructions, such as knitted, and non-woven constructions may be used, provided they meet the design and structural requirements of the two standards. Additionally, it has been found that up to about 15 percent of the total fabric weight may comprise other synthetic materials, such as polyester, nylon, etc.

[0032] The pretreated fabric is then ready for dyeing and finishing. The dyeing is formed in a jet dye machine such as a Model Mark IV manufactured by Gaston County Machine Company of Stanley, N.C. The specific dyes used to color the fabric of the

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present invention are basic, or cationic, dyestuffs. The cationic dyes are known for their acceptability in dyeing polyesters, nylons, acrylics, and modacrylics. However, it has heretofore not been known that these dyes could be formulated to dye modacrylic material in order to meet the luminance and chromacity criteria for safety apparel according to ANSI/ISEA-107 and the fire resistant criteria of ASTM F 1506. Two dye formulations have been found to meet the high visibility criteria for ANSI/ISEA-107. A dye formulation for International Yellow comprises basic Flavine Yellow, available from Dundee Color of Shelby, N.C. as color number 10GFF. It has been found that this dyestuff applied at between about 2 to 2 1/2 percent of fabric weight successfully achieves the ANSI criteria. A dye formulation for International Orange may be formed from Blue and Red cationic dyestuffs, available from Yorkshire America in Rock Hill, S.C., as color numbers Sevron Blue 5GMF and Sevron Brilliant Red 4G and applied at percentages sufficient to meet the ANSI/ISEA-107 shade requirements.

[0033] Either of the dyestuffs described above are added to the jet dye machine. The Ph of the bath is established at between about 3 and 4, with acid used to adjust the Ph as required. The bath temperature in the jet dyer is raised at about 1.degree. C. per minute to a temperature of about 80.degree. C., where the temperature is held for approximately 10 minutes. The temperature is then raised approximately 0.5.degree. C. per minute to a temperature of 98.degree. C. and held for approximately 60 minutes. The bath is then cooled at about 2.degree. C. per minute to 60.degree. C. At that point, the bath is emptied and rinsing with water at 60.degree. C. occurs until the dye stuff residue in the jet dyer is removed. At this point, the dyeing cycle is complete. Wet fabric

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is removed from the dye machine where it is dried on a standard propane open width tenter frame running at approximately 40 yards per minute at approximately 280.degree. F. to stabilize width and shrinkage performance. At the completion of this process, a fabric that meets the ANSI standard for high visibility safety apparel, the ASTM standard for flame resistance, the fabric construction also meets the Federal Test Method Standard 191 A, Method 5931 for electrostatic decay, and the ESD ADV11.2-1995 standard for voltage potential.

[0034] The finished fabric may be used to construct an unlimited number of types of safety apparel. The most common types are shirts or vests, and trousers or coveralls. The final constructed garments are designed and formed to meet the design, structural, and fastening criteria of the ANSI and ASTM standards.

Campbell et al. differs from the instant invention in failing to teach that the dyeing process of dyeing the blended fabric with cationic dyes employs a dyeing assistant in the dyebath. Lunsford et al. is applied for teaching a process of dyeing aramid fibers and blends thereof using cationic dyes at temperatures below 100 degrees centigrade with the addition of all of the dyeing assistants claimed in applicant's claim 1. He teaches that at temperatures below 100 degrees centigrade inherently flame resistant fibers (aramid) resist dyeing, and they also become susceptible to laundry shrinkage. Col 2 second paragraph. In order to dye the inherently flame resistant fibers at temperatures between 70 degrees centigrade and 100 degrees centigrade, dyeing assistants as claimed in applicant's claim 1 may be used. During the dyeing process, the dye-assistant promotes the penetration of the inherently flame resistant fibers by the

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dye so that the fibers are changed in color. Patentee states, In that dyeing is conducted at relatively low temperatures, dye-assistants that adequately promote dyeing of inherently flame resistant fibers at low temperatures **must** be used. In addition the use of dyeing assistants as claimed further limits subsequent shrinkage caused by laundering. The dyeing assistants listed in this paragraph include all of those claimed in instant claims 1, including aryl ether and benzyl alcohol as claimed in instant claim 10.

It would have been obvious to the man having skill in the art at the time the invention was made to add the dyeing assistants disclosed by Lunsford to the dyebath of Campbell for the benefits disclosed by Lunsford in col 1 and in order for the cationic dyes to penetrate the aramid portion of the fiber blend. Lunsford teaches that aramid is not dyed at any temperature below 100 degrees centigrade without the use of dyeing assistants. Accordingly the aramid portion of the fabric dyed by Campbell is at most only stained in the dyebath. Note that in Campbell's embodiments, the fiber blend is substantially modacrylic and the dyeing process is sufficient to meet the luminance and chromacity criteria for safety apparel according to ANSI/SEA-107 since the modacrylic is very receptive to cationic dyes. Applicant claims a blend that contains 1-99% aramid fiber. It is clear from the teachings of Lunsford that blends containing substantially more aramid than modacrylic would be substantially undyed using the dyeing process of Campbell and that to achieve adequate dyeing to meet the luminance and chromaticity standards defined above, the skilled dyer would have to use one or more of the known dye assistants taught by Lunsford in the dyebath of Campbell. Regarding the limitations of claims 8 and 9, it is within the skill of the artisan to adjust the amount of dye assistant

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to the amount of aramid in the dyebath, for it is well known in the art that additives to a dyebath are used owf (on the weight of the fiber) which will imbibe the dyeing assistant.

Regarding claim 11, the examiner is not applying Campbell as an anticipatory reference because the aramid portion of Campbell's fabric, even if only 3%, is substantially undyed.

Note Campbell et al, US 6,787,228 B2 which describes the same process as the Campbell reference used in the above rejection, but does not disclose the addition of the antistatic component to the fiber blend.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Margaret Einsmann whose telephone number is 571-272-1314. The examiner can normally be reached on 7:00 AM -4:30 PM M-W and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

12/16/05


Margaret Einsmann
Primary Examiner
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